Amendments to the Claims

1 (currently amended). A photoreceiver cell with separation of color components of light incident to its surface, formed in a silicon substrate of the conductivity of [[the]] a first type with ohmic contact and comprising:

- a first region of the conductivity of [[the]] a second type, located in [[the]] a near-surface substrate layer, which is divided into [[the]] first, second and third portions by [[the]] regions of silicon dioxide and equipped with [[the]] first, second and third ohmic contacts, and which form [[the]] first, second and third p-n junctions with the substrate;

- a first heavily-doped region of the same conductivity type as the substrate, located under said first region of the conductivity of the second type, which forms a first potential barrier for charge carriers generated in [[the]] a substrate region under the first barrier;

- a second heavily-doped region of the same conductivity type as the substrate, located under said first heavily-doped region, which forms a second potential barrier for charge carriers generated in [[the]] a substrate region under the second barrier;

- a third heavily-doped region of the same conductivity type as the substrate, located under said second heavily-doped region, which forms a third potential barrier for charge carriers generated in [[the]] a substrate region under the third barrier;

- wherein said first, second and third heavily-doped regions have relative positioning and configuration ~~, which provide formation of the~~ to form first and [[the]] second channels for diffusion of the secondary carriers generated in the substrate regions located under the first and the second potential barriers to the first and the third p-n junctions respectively ~~; in this case~~ , wherein the length of the channels does not exceed the diffusion length of the secondary charge carriers;

- wherein said first, second and third ohmic contacts are connected to the first, second and third outputs of the photosensitive cell, which are connected via [[the]] readout circuits to the positive pole of [[the]] a voltage source, whose negative pole is connected to the substrate via an ohmic contact.

2 (new). The photosensitive cell of Claim 1, wherein the first and second channels have the first conductivity type but are not as heavily doped to the first conductivity type as the first, second and third heavily-doped regions.

3 (new). A photoreceiver cell for generating electrical current responsive to light incident on a surface area of a semiconductor substrate from above the semiconductor substrate, the photoreceiver cell comprising:

a plurality of first regions of a first conductivity type in the semiconductor substrate, each first region being present underneath said surface area to receive the incident light and generate minority charge carriers in response to the incident light, wherein underneath said surface area, the first regions are spaced from each other and overlie one another;

one or more second regions of a second conductivity type opposite to the first conductivity type, each second region connected to the photoreceiver cell's output, wherein each first region forms a p-n junction with the one or more second regions;

wherein underneath said surface area, in at least one vertical cross section passing through said surface area, for at least two first regions R_1, R_2 in said plurality of the first regions, the semiconductor substrate's entire region which underlies the first region R_1 and overlies the first region R_2 has the first conductivity type but is heavier doped to the first conductivity type than the first regions R_1, R_2 underneath said surface area, said entire region providing a potential barrier to minority charge carriers formed in the first region R_2 when the p-n junctions formed by the first regions R_1, R_2 with the one or more second regions are reverse-biased.

4 (new). The photoreceiver cell of Claim 3, wherein the plurality of the first regions comprises at least three first regions $R_1, R_2, \ldots, R_n$ ($n>2$);

wherein underneath said surface area, in at least one vertical cross section passing through said surface area, for each two first regions R_i, R_{i+1} ($i=1, \ldots, n-1$), the semiconductor substrate's entire region r_i which underlies the first region R_i and overlies the first region R_{i+1} has the first conductivity type but is heavier doped to the first conductivity

type than the first regions R_i, R_{i+1} underneath said surface area, said entire region r_i providing a potential barrier to minority charge carriers formed in the first region R_{i+1} when the p-n junctions formed by the first regions R_i, R_{i+1} with the one or more second regions are reverse-biased.

5 (new). The photoreceiver cell of Claim 4 wherein said entire regions r_i are part of a continuous region having the first conductivity type and being heavier doped to the first conductivity type than any one of the first regions.

6 (new). The photoreceiver cell of Claim 3 wherein at least one of the first regions extends from underneath another one of the first regions underneath the surface area to one of said p-n junctions which is adjacent to a top surface of the semiconductor substrate.

7 (new). The photoreceiver cell of Claim 3 wherein all said p-n junctions are adjacent to a top surface of the semiconductor substrate.

8 (new). The photoreceiver cell of Claim 3 further comprising circuitry for reverse-biasing the p-n junctions and for reading currents at the one or more second regions.

9 (new). A photoreceiver cell for generating electrical current responsive to light incident on a surface area of a semiconductor substrate from above the semiconductor substrate, the photoreceiver cell comprising:

a plurality of first regions of a first conductivity type in the semiconductor substrate, each first region being present underneath said surface area to receive the incident light and generate minority charge carriers in response to the incident light, wherein underneath said surface area, the first regions overlie one another;

one or more second regions of a second conductivity type opposite to the first conductivity type, each second region connected to the photoreceiver cell's output, wherein each first region forms a p-n junction with the one or more second regions;

wherein underneath said surface area, for at least one first region R in said plurality of the first regions, the semiconductor substrate immediately below an entire lower boundary of the region R has the first conductivity type but is heavier doped to the first

conductivity type than the first region R, to provide a potential barrier to minority charge carriers formed below the semiconductor substrate's region below the first region R when the p-n junction formed by the first region R with the one or more second regions is reverse-biased.

10 (new). The photoreceiver cell of Claim 9, wherein the semiconductor substrate immediately below an entire lower boundary of each first region has the first conductivity type but is heavier doped to the first conductivity type than the first region, to provide a potential barrier to minority charge carriers formed below the semiconductor substrate's region below the first region when the p-n junction formed by the first region with the one or more second regions is reverse-biased.

11 (new). The photoreceiver cell of Claim 10, wherein the plurality of the first regions comprises at least three first regions.

12 (new). The photoreceiver cell of Claim 9 wherein each said p-n junction is adjacent to a top surface of the semiconductor substrate, and at least one of the first regions extends from another one of the first regions underneath said surface area to one of said p-n junctions.

13 (new). The photoreceiver cell of Claim 12, wherein each said p-n junction is contacted by one of the first regions from below.

14 (new). A method for operating the photoreceiver cell of Claim 3, the method comprising:

connecting the one or more second regions to a first potential through one or more readout circuits; and

connecting the semiconductor substrate to a second potential to reverse-bias the p-n junctions.

15 (new). A method for operating the photoreceiver cell of Claim 9, the method comprising:

connecting the one or more second regions to a first potential through one or more readout circuits; and

connecting the semiconductor substrate to a second potential to reverse-bias the p-n junctions.

16 (new). A method for forming the photoreceiver cell of Claim 4, the method comprising:

providing the semiconductor substrate comprising a third region of the first conductivity type, the third region comprising the first regions; and

introducing dopant of the first conductivity type into the third region between the first regions to provide the potential barriers below the first regions.

17 (new). A method for forming the photoreceiver cell of Claim 9, the method comprising:

providing the semiconductor substrate comprising a third region of the first conductivity type, the third region comprising the first regions; and

introducing dopant of the first conductivity type into the third region between the first regions to provide the potential barrier below the first region R.